

NEWSLINE

Published weekly for employees of Lawrence Livermore National Laboratory

Friday, September 29, 2000

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FROM THE
DIRECTOR'S
OFFICE

Martha Kohler

Yucca Mountain moves closer to repository status

The Department of Energy is making preparations to recommend a site at Yucca Mountain Nevada to be the monitored geologic repository for high-level spent nuclear fuel and radioactive waste. Credit is due, in part, to the Laboratory, which has made major technical contributions through the years characterizing the site, determining the thermal effects on the site from storage of radioactive wastes, and selecting and characterizing materials for the waste storage canisters.

As leader of the Yucca Mountain Program, I'd like to provide an update on the importance of the program and what lies ahead. The Yucca Mountain Program is incredibly interesting for its wide range of scientific and engineering challenges, regulatory oversight, stakeholder involvement and politics. LLNL has been involved in the national nuclear-waste disposal program since 1978. Lawrence Berkeley, Los Alamos and Sandia are also supporting DOE, as are a number of for-profit companies and the USGS.

The purpose of the program is to site, license, construct and operate a geologic repository for the disposal of high-level radioactive waste, which includes spent nuclear fuel from civilian power plants, materials from the cleanup of DOE's nuclear weapons complex and disposal of appropriately packaged weapons-capable material. It is a significant requirement of the national nuclear material management system and the nuclear fuel cycle.

The concept of geologic disposal of nuclear waste as a preferred method can be traced back to a 1957 National Academy of Science report. In 1982, Congress directed DOE to find a site for the radioactive waste now in temporary storage throughout the United States. The search identified three locations, and then in 1987, Congress amended its earlier act to focus solely on the Yucca Mountain site.

Currently, spent nuclear fuel and high-level radioactive wastes are stored at 72 nuclear plant sites and five DOE facilities across the United States. Last October, the National Academy of Sciences held a workshop in Irvine to consider the technical and public policy issues of the Yucca Mountain site and its alternatives. Yucca Mountain is being recommended as the potential site for geologic storage of the radioactive waste for many reasons. It is a desert environment with an annual rainfall

See **DIRECTOR'S OFFICE**, page 7

House increases funding for NIF

Stockpile stewardship, especially the National Ignition Facility, Laboratory Directed Research and Development, and travel will see significant funding increases, thanks to a \$23.6 billion Energy and Water Appropriations Conference Report.

The FY2001 bill, agreed upon by House and Senate negotiators Wednesday and the full House Thursday, must still be approved by the Senate before it can go to the president for signature.

Under the bill, NIF would get \$199 million in project funds for FY2001, rather than the \$74 million in the orig-

inal request, while LDRD would jump from the current 4 percent limit to 6 percent. Overall, the Stockpile Stewardship Program would see a funding level of \$5.033 billion, \$606 million above the current funding level and \$394 million more than the original administration request.

"We're very pleased that Congress has recommended additional funding for the National Ignition Facility, reaffirming that the project should move forward," said

See **NIF**, page 5

Lab trains the trainers of tomorrow's scientists

By **Elizabeth C. Rajs**

NEWSLINE STAFF WRITER

High school and community college science teachers from throughout California met at the Laboratory last weekend for two days of intensive training that featured hands-on research, laboratory tours and a take-home notebook full of lesson plans.

During the course of the first Edward Teller Science & Technology Education Symposium, the 101 teachers in attendance also had an opportunity to hear Director Emeritus Edward Teller, have dinner with scientists and meet Nobel laureate Steven Chu, who was the banquet keynote speaker.

"It was a tremendous success," said Stan Hitomi, a science teacher at Monte Vista High School in Danville who helped plan the symposium. "At the end of the first day, I thought the teachers had already gotten their money's worth. It was fantastic. They got a chance to listen to two great speakers — Dr. Teller, who is

See **SCIENTISTS**, page 8



RICHARD FARNSWORTH/STEP

Joanna Albala (right), a senior biomedical scientist in BBRP, helps a science teacher transfer a gel for staining. Albala led a hands-on workshop Saturday for biology teachers in recombinant protein expression and purification.

Teller says interest, not knowledge, is key

By **Don Johnston**

NEWSLINE STAFF WRITER

With a firm grasp on his wooden staff and his wry wit, Director Emeritus Edward Teller delivered a sermon to science teachers last week on the virtues of unfettered scientific inquiry and

the pursuit of "new knowledge."

"To begin with, I'd like to tell you what your job is in the high school classroom," Teller told the teachers attending the first two-day Teller symposium. "To know about science isn't so important.

See **TELLER**, page 8

Lab's role in consortium to cure TB is crystal clear

The Lab will house a key research component as part of a National Institutes of Health-funded, six-nation consortium of 13 institutions led by Los Alamos National Laboratory to help develop ways to fight tuberculosis.

Los Alamos will receive a five-year, \$28 million grant, distribute the funds and coordinate the work among all the institutions. The LLNL Macromolecular Crystallography and Structural

Genomics group will receive a \$4 million sub-grant to perform structural research aiding in the design of drugs, which may help eradicate tuberculosis.

Tuberculosis is the world's number-one infectious disease, claiming about 2 million lives annually. A major concern in the United States is the fact that many people infected with the AIDS virus

See **TB**, page 5



Dimolitsas joins optics board

— Page 3



Getting a grasp on ergonomics

— Page 5



LAB COMMUNITY NEWS

Weekly Calendar

Technical Meeting Calendar, page 4

Saturday
30

The Lab's American Indian Activity Group (AIAG), in conjunction with Livermore's American Indian Center, is sponsoring a **rummage sale** from 8 a.m. to 3 p.m. at the Indian Center, 298 Junction Ave. All donations accepted; proceeds will be split and applied to AIAG scholarship funds and the center's education programs. Contact: Darlene Yazzie, 3-7846, or Mary Puthoff, 606-3405.

Tuesday
3

Betsy Carpenter, counselor for Advance Directives at the Older Adult Resource Center, will present **"When You Can No Longer Speak for Yourself About Your Medical Care,"** from 11:45 a.m. to 1:15 p.m. in the Bldg. 123 auditorium. Topics will include how to design an "advance health-care directive" and a "pre-hospital do not resuscitate" form, how to clarify your personal values; and patient rights. Lab/SLO employee family members may attend without badges. Contact: Marnette Yeager, 2-1217.

...

George Van Tiem, group leader for **Los Alamos National Laboratory's Emergency Management & Response**, will be at the Lab to talk about what happened during the devastating fire this summer and how Los Alamos responded. His talk takes place at 2 p.m. in the Bldg. 543 auditorium.

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Want better relationships? **Codependents Anonymous** (CoDA) meets Tuesdays at noon in Bldg. 571, room 2016. The group offers 12 steps to recovery from codependency. Contact: Mike, 3-4827, or Jane, 4-4689

Wednesday
4

As part of California Rideshare Week Oct. 2-6, the Lab is hosting a **Commuter Fair** from 11:30 a.m.-1:15 p.m. outside the South Cafeteria, featuring displays by a number of outside agencies. (See article on page 4 for more details.) Employees are encouraged to try a commute alternative at least once during the week of Oct. 2-6.

Thursday
5

The Lab-sponsored **parenting class**, "Balancing Work and Family," resumes at noon in Bldg. 671, room 2000. Class discussion focuses on effective parenting techniques for infants to 12-year olds and is facilitated by parenting educator Ruth Gasten. Classes are open to all employees at no cost. For more information, see http://www-r.llnl.gov/OCM/parent/parenting_home.html

UP
&
COMING

B Division's **fall book sale** returns Oct. 9-13, from 11:30 a.m. to 1:30 p.m. daily in Bldg. 132, room 1200 (Q- or L-cleared access only). The sale will include used books, videos, CDs and books-on-tape. All proceeds are used to buy Christmas gifts for needy children. Contact: Lynn Groves, 2-1684.

Employees invited to Roger Batzel memorial

All Laboratory employees are invited to attend a commemoration in honor of Director Emeritus Roger Batzel tomorrow at 10 a.m. in the West Cafeteria.

The event will be a remembrance of the Laboratory's sixth director, his tenure and impact on the Lab. A reception will follow. People who will be attending should RSVP by phoning Sheryl Rikard, 3-0614, or Patti Carter, 2-740.

Batzel, who served as LLNL's director from 1971 to 1988, more than one-third of the Laboratory's history, is credited with playing an important role in the growth and transition of the Laboratory from a defense and nuclear facility to a multi-program institution.

Batzel joined the Laboratory in 1953, a year

after LLNL started, as assistant division leader in Chemistry. During his career, he served as the leader of the chemistry, nuclear testing, space reactors and biomedical research directorates.

Among his many honors, he was a fellow of the American Physical Society, a fellow of the American Association for the Advancement of Science and a recipient of one of the Department of Energy's highest awards, the Distinguished Associate Award.

Batzel died on July 29, after a massive heart attack. More information about him is available at two Lab Websites: www.llnl.gov/PAO/Newsstand/articles/2000/8-04-00-batzel.html and www.llnl.gov/llnl/06news/NewsMedia/Batzelcap.html

LLESA booth to offer information on breast cancer

October is National Breast Cancer Month. To raise awareness about the disease, the Lab's Employee Services Association (LLESA), is sponsoring a breast cancer information booth, 11 a.m.-2 p.m. Friday, Oct. 6, at the Employee Store (Bldg. 317).

Breast cancer strikes one out of every nine women. The LLESA booth will offer information on self-examinations, mammograms and guidelines for early detection of breast cancer.

Breast cancer stamps will also be available for purchase. A portion of the stamps' sales goes toward breast cancer research.



To date, the Breast cancer stamp, which costs 40 cents and is good for First-Class postage, has raised \$15.7 million for research.

Two Tri Valley fair students chosen as Discovery semifinalists

Two middle school students who competed in the Tri Valley Science and Engineering Fair (TVSEF) earlier this year were recently selected as semifinalists in the Discovery Young Scientist Challenge.

Vincent Fielder Ross, an eighth grader at St. Isidore's Catholic School in Danville, and Chi Phuong Nguyen, a seventh grade student at Pine Valley Middle School in San Ramon, were among 400 semifinalists chosen by Discovery Communications and Science Service.

Although they didn't make the final cut to 40 finalists, Ross and Nguyen were chosen as semifinalists from a field of more than 1,600 middle school students from 23 states. The Discovery Young Scientist Challenge, now in its second year, was open to approximately 10 percent of the middle school students who had competed in a regional fair affiliated with the Intel International Science and Engineering Fair.

The students, nominated by the judges at the TVSEF, were invited to compete on the basis of not only sound scientific research, but also effective individual communication and leadership skills, according to fair director Karen Kiernan.

The Tri-Valley Science and Engineering Fair is co-sponsored by the Lab.

"We're very proud of Vincent and Chi. They are outstanding representatives of the Tri-Valley Science and Engineering Fair," Kiernan said. "They achieved this success as middle school students. We're looking forward to seeing what they accomplish as high school students."

Each year, the Tri-Valley fair sends its senior sweepstakes winners to compete at the Intel International Science & Engineering Fair. Since the TVSEF started four years ago, its sweepstakes winners have come home from the international fair with top awards, Kiernan noted.

The Discovery Young Scientist Challenge now provides the younger, middle school students an opportunity to compete at a national level as well.

For more information on the Discovery Young Scientist Challenge, visit www.school.discovery.com/sciencefaircentral/dysc.

Newsline

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IN MEMORIAM

Calvin Palmer

Calvin Marion Pierce Palmer, a former machinist, died Sept. 22 in Grass Valley. He was 80.

Palmer worked at the Lab for more than 25 years.

He was born in Trinity County and lived in Livermore for 23 years. He was a veteran of World War II, a member of the Grass Valley Planning Commission and the Nevada County Historical Society. He also enjoyed restoring automobiles.

He is survived by his son, Don; a brother, seven grandchildren and six great grandchildren.



AROUND THE LAB



FAMILY DAYS UPDATE

Retirees contact LLESA for Lab entry

Retirees who wish to attend Family Days' events should call the LLESA office directly at 422-9402. They will need to submit their name and the names of their guests.

LLESA personnel will set up entry into the Lab directly with the Westgate Badge Office. All retirees will be receiving a letter this week at their home address with further information about Family Days.

Help is a mouse click away

The Family Days Web page is your resource for planning events for the upcoming Family Days open house. Family Days will be held Oct. 21-22 at the Lab main site only. Site 300 will not be open for Family Days.

Check out <http://www-r.llnl.gov/family2000/>, or click on the Family Days icon on the Grapevine home page, for a complete guide on

security issues, protecting information, classification and export control concerns, hazards controls, food services, disabilities services and much more. The pages are updated regularly, so check in often.

Send your schedules to Newsline

Newsline will publish a special edition that will serve as the guide during Family Days, Oct. 21-22.

So the Newsline staff needs to know from you soon what will be open, what you will display, activities, programs, etc. so these events can be included in the special edition.

The deadline for submitting material is Oct. 6. Please send your items to mailto:newsline@llnl.gov. If you have photos you would like to include, Newsline can take them electronically, or you can mail them to L-797.

For more information, call 3-3103, or see the

Planning Guide on the Family Days Web page, <http://www-r.llnl.gov/family2000/>.

Deadline approaches for TID support

If you need assistance with posters, video presentations or other materials for Family Days, the Technical Information Department needs to hear from you by Oct. 2 in order to have everything ready on time.

For more information, contact TID at 2-9624 or see the Family Days Web page at <http://www-r.llnl.gov/family2000/>

Remember, all scientific and technical information not previously reviewed and released, which will be displayed during Family Days, needs to go through the review and release process before it may be publicly displayed or disseminated.

For more information, see the Web site at <http://www-r.llnl.gov/tid/dars/dars-home.html> or call 2-5808.

BRIEFLY

Dimolitsas named to Maxoptix board

Engineering AD Spiros Dimolitsas has been appointed to the board of directors of Maxoptix Corp., a Fremont-based leader in optical data-storage technology.

"Serving on boards like Maxoptix is good for Engineering. I can get an early look at what is happening in the field of computer technology, especially storage, as well as a different perspective on issues facing Bay Area companies, like recruiting and retention," Dimolitsas said. "At the same time, I can help companies become more aware of the value of national laboratories."

Charles Christ, chairman of the Maxoptix board, said in a written announcement, Dimolitsas' "experience in computer technology and in the industry will be a great asset in building our organization."

Dimolitsas joined the Laboratory in 1995 as associate director for Engineering. Prior to the Lab, he worked at Communications Satellite Corp. (COMSAT) for 10 years where he held several positions, the most recent as a director. Before that, he was with United Technologies MOSTEK Corp., the Mayo Clinic, and High Energy and Nuclear Equipment Corp. (Switzerland).

Dimolitsas is a member of the American Management Association and its Manufacturing and Technology Council and is a fellow of the Institute of Electrical and Electronics Engineers (IEEE). In 1992 he received the IEEE Outstanding Achievement Standards Medallion for contributions and technical leadership in the standardization of source-coding technology for international telecommunications.

He has authored 60 reference papers, holds several patents and has written and presented

more than 150 position papers to the International Telecommunications Union. Dimolitsas holds a doctorate degree in electrical and computer engineering from Sussex University in England, a master's degree in nuclear-reactor science and engineering from London University and a bachelor's degree in physics from Sussex University.

Security refresher is due today

Today is the deadline for completing two security briefings, the 2000 Security Refresher Briefing and the INFOSEC threat briefing.

All LLNL employees and contractors must read the 2000 Security Refresher Briefing (SRB), and take the quiz at the end. In the past, only Q- and L-cleared employees were required by DOE to read the annual security refresher briefing and pass the quiz.

The briefing is available on the Safeguards & Security Website at: <http://www-security.llnl.gov/ssdpub/IPSD/refresh00.html> and on the Grapevine Intranet (<http://www-r.llnl.gov/>). Click on Safeguards & Security Program, Information Resources, 2000 Annual Security Refresher Briefing.

People who are exempt from the annual requirement are visitors, off-site contractors without clearances, contractors whose clearances are held at other DOE facilities, and DOE employees.

In order to take the quiz on the LLNL internal Web testing system, you will need your institutional ID and password (the same ones you use for LITE). If you do not have an institutional ID and password, you can get one at: https://www-ais.llnl.gov/llnl_only/docs/menu/.

The INFOSEC threat briefing, titled "Information Security Threats: Recent, Real, and Relevant," is available from your department office. The 35-minute videotaped briefing is mandatory for Q-cleared and L-cleared employees and contractors at the Livermore site, Site 300, and the Nevada Test Site.

No Lab holiday for Veterans Day

The University of California Laboratory Administration Office has announced that negotiations with DOE to add a 13th holiday for the

UC laboratories have not been conclusive.

Discussions were initiated after the UC Regents approved the observance of Veterans Day for the UC campuses and medical schools. Therefore, Lawrence Livermore and Berkeley labs will not observe Veterans Day this year as a holiday. Los Alamos has the same total number of holidays as LLNL and LBNL, but includes Veterans Day.

Further discussion on adding an additional holiday will resume in the coming year.

Today is women's symposium deadline

Today is your last day to sign up for "LLNL 2020: Women Forging the Future of Science and Technology" close today (Sept. 29). The two-day conference, which takes place Thursday and Friday, Oct. 26-27, at the San Ramon Marriott, features several keynote speakers, 18 focus groups and a poster session.

Among the featured speakers are business-woman Debra Crumpton, nuclear chemist and National Medal of Science recipient Darleane Hoffman, astrophysicist Jill Cornell Tarter; San Diego State University professor Shirley Weber, Assistant Attorney General Lois Schiffer, medical reporter Dr. Kim Mulvihill, Sandia Vice President Mim John, and NASA engineer Jacqueline Mims, among others.

Focus groups will discuss a wide variety of topics, from bioterrorism and merging security threats; from the treatment of diseases and prevention to the study of genes and proteins; from the future of public and private research and development to a look at Lab women in nontraditional and high-tech careers.

Today is also the last day to submit material for the conference's poster session. For more information see the Web page at <http://www.llnl.gov/2020/>. LLNL employees providing material for the abstract and at the conference must follow guidelines for review and release for a public conference or be administrative information only.

Cost of the conference is \$250 and includes registration, all speakers, panel discussions and meals. For more information on the forum or to register, go to the forum Website at <http://www.llnl.gov/2020>. The LTRAIN code for registration is OE0122.



NEWS YOU CAN USE

Commuter Fair will unveil new discount fuel program

With gas prices teetering on the brink of \$2 per gallon, there's no better time to consider car-pooling, vanpooling or any other alternative to driving solo to work.

As luck would have it, next week is California Rideshare Week and the Lab is hosting a Commuter Fair on Wednesday from 11:30 a.m. to 1:15 p.m. outside the South Cafeteria.

Sponsored by the Transportation Systems Management Program (TSMP) and the Public Affairs Community Relations office, the fair will feature displays by a number of outside agencies, as well as information on several methods to reduce commute costs.

Information will also be available on a new program scheduled to start in mid-December that will allow vanpool drivers to purchase gas at the Lab's pumps at a discounted price.

Dubbed "Fill'er Up With Gas for Less," the six-month pilot program will be offered jointly by LLESA and TSMP to registered vanpool drivers.

"Until now, only government-owned vehicles could be fueled at the station, but now vanpools can take advantage of reduced fuel costs afforded LLNL due to its bulk buying power," said D'Anne Miller, program manager for TSMP. "The goal of the program is to increase the number of vanpools coming to LLNL and to help the existing vanpools."

For more information on the incentive programs, visit TSMP's Website <http://www-r.llnl.gov/tsmp> or call 2-RIDE.

INTERNAL TRANSFER OPPORTUNITIES

Tag	Requisition	Classification	Title	Organization
PH	809	150.1	Resource analyst	Physics & Advanced Technologies
EP	838	150.2	Resource analyst	Environmental Protection
LA	897	220	Post-doc research staff member	Physics & Advanced Technologies
LA	930	220	Post doc research staff member	Physics & Advanced Technologies
LA	939	220	Post doc research staff member	Physics & Advanced Technologies
CH	928	242	Chemist	Chemistry & Materials Sciences
EV	931	242	Geochemist/chemist	Earth & Environmental Sciences
EE	852	249	Engineer	Electronics Engineering
EE	859	249	Quality engineer	Electronics Engineering
ME	464	249	Project area engineer	Mechanical Engineering
ME	864	249	Engineer	Mechanical Engineering
ME	885	249	Engineer	Mechanical Engineering
ME	891	249	Pre-assembly manager	Mechanical Engineering
EE	894	249/285	System controls engineer	Electronics Engineering
LA	866	270	Physicist	Physics & Advanced Technologies
LA	926	270	Physicist	Physics & Advanced Technologies
EE	870	337.1	Engineering technical associate	Electronics Engineering
EE	937	337.1	Engineering technical associate	Electronics Engineering
NA	839	391.1	Engineering associate	NAI
NF	589	405.3	Administrative specialist III	National Ignition Facility Programs
NA	832	405.4	Administrative specialist IV	NAI
BO	918	451.3	Principal accounting assistant	Finance
EE	780	531.2/3	Technologist	Electronics Engineering
EE	829	531.3	Senior technologist	Electronics Engineering

More information on these job postings as well as those at other UC sites and outside organizations is available through the World Wide Web. Go to the Lab's internal home page, click on "Services," then click on "Career Center." Once there, scroll down to "Information and Resources," where links to internal and external postings can be found.

Technical Meeting Calendar

Friday
29

INSTITUTE FOR GEOPHYSICS & PLANETARY PHYSICS

"The Detection of Terrestrial Extra-Solar Planets via Gravitational Microlensing

From Space," by David Bennett, University of Notre Dame. Noon, Bldg. 319, room 205 (open area). Contact: Joanna Allen, allen64@llnl.gov, or see <http://www.llnl.gov/urp/IGPP/SemCalendar/IGPPSemCal.html>

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"Multigrid Methods for Porous Media Flows," by Gabriel Wittum, Universitat Heidelberg. 10 a.m., Bldg. 451, room 1025 (uncleared area). Contacts: Rob Falgout, 2-4377, or Leslie Bills, 3-8927, or see <http://www.llnl.gov/casc/calendar.shtml>

Monday
2

UC DAVIS, DEPARTMENT OF APPLIED SCIENCE

"OHM's Law and Spheromaks," a seminar in memory of Professor William Newcomb, by T.K.

Fowler, UC Berkeley. 4 p.m., Bldg. 661, room 13 (open area). Refreshments served at 3:30 p.m. for a "meet-the-speaker" session before seminar and at 5 p.m. after the seminar. Contact: Estelle Miller, 2-9787.

Tuesday
3

MATERIALS SCIENCE & TECHNOLOGY

"Developing Ceramic Dielectrics for Pulsed Power Applications," by Brian L.

Gilmore, University of Missouri-Rolla. 10:30 a.m., Bldg. 235, room 1090 (uncleared area). Contact: Nan Poggio, 2-9279.

Thursday
5

V DIVISION

"Astrophysics With Intense Lasers," by Jave Kane, LLNL. 10:30 am, Bldg. 219, room 163. Contact: Jim Dunn, 3-1557, or Raylene Miller, 2-6300.

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"Coupled Flows With a Focus on the Eye," by Victor Barocas, University of Minnesota, Twin Cities. 10 a.m., Bldg. 551W, room 1400 (uncleared area). Contacts: Bobby Philip, 3-9797, or Leslie Bills, 3-8927. For more information see <http://www.llnl.gov/casc/calendar.shtml>

Friday
6

CHEMISTRY & MATERIALS SCIENCE

"Bond-Order Potentials: Bridging the Electronic to Atomistic Modeling Hierarchies," by David G. Pettifor,

University of Oxford, Department of Materials, UK, 10:30 a.m., Bldg. 235, room 1090 (uncleared area). Contact: Patrice Turchi, 2-9925, or Nancy Pullen, 2-4321.

INSTITUE FOR GEOPHYSICS & PLANETARY PHYSICS

"Coupling of Climate Change and Tectonics on Venus," by Sean Solomon, Carnegie Institution of Washington. Noon, Bldg. 319, room 205 (open area). Contact: Joanna Allen, 3-0621, or see <http://www.llnl.gov/urp/IGPP/SemCalendar/IGPPSe mCal.html>.

PHYSICS & ADVANCED TECHNOLOGIES

"Effects of Anharmonicity on Equations of State for Solids Under Strong Compression," by Wilfried Holzapfel, University of Paderborn, Germany. 1:30 p.m., Bldg. 219, room 163 (open area).

Contact: Bill Nellis, 2-7200, or Miriam Rinnert, 2-7369.

Monday
9

H DIVISION

"Aspects of D and F Electron Systems," by Anna Maria Delin, LLNL. 10 a.m., Bldg. 319, room 205 (open area).

Contact: Giulia Galli, 3-4223, or Darlene Klein, 4-4844.

Thursday
12

PHYSICS & ADVANCED TECHNOLOGIES

"CP Violation in the B Meson System: Recent Results From the Belle Experiment," by Eric

J. Prebys, Princeton University, 1:30 p.m. Bldg. 211, room 227 (uncleared area). Contacts: Eugene Brooks, 3-7341 or Pat Smith, 2-0920.

Deadline for the next calendar is noon, Wednesday, Oct. 4.

- Address e-mail to tmc-submit@llnl.gov or fax to 2-9291.
- Mail listings to Technical Meeting Calendar, L-797.
- Telephone ext. 2-9709 for information regarding the printed calendar.

For information on electronic mail or the newsgroup llnl.meeting, contact registrar@llnl.gov



NEWS OF NOTE

New videos provide better grasp on ergonomic safety

By Dale Sprouse
TECHNICAL INFORMATION

Videotapes are being made available to the Hazards Control safety library and to Laboratory ES&H teams of talks held at the Laboratory recently by ergonomics expert Ira Janowitz.

An ergonomics consultant on the staff of the University of California Ergonomics Program (UC Berkeley and UC San Francisco), Janowitz came to the Lab in August to discuss potential ergonomic hazards that researchers face in their laboratories and to talk about the ergonomics of crafts work.

Both talks were sponsored by the ISM Rollout Implementation Team and the Laboratory Site Operations' ES&H Advisory Committee.

Hazards Control's Bill Wells, a member of the advisory committee, described the talks as "very good ones" that helped provide fresh perspectives on ergonomic issues and the ways to deal with them. "We wanted to make the videotapes available to those who deal with ergonomic issues at the Laboratory and who were unable to attend the presentations," said Wells.

During his talk on science ergonomics, Janowitz emphasized that "precision is an enemy of ergonomics."

When people perform precise work, he said, offering examples such as working with pipettes or taking tissue samples in biology labs, their bodies are put under an increased load that can lead to ergonomic problems. "Trying to deal with very precise targeting increases the static load," he said.

Showing slides and videos of researchers at their work benches, Janowitz discussed what he called "classic ergonomic risk factors" — high repetition, high force and awkward posture.

"People don't think of labs as high-force work, but they can be," he explained. "Any time you use a tool

that requires a pinch grip, such as a pipette or tweezer, that is a high-force activity. Tendons at the base of the thumb, for example, can become inflamed from doing lots of pipette work."

Many science laboratories are configured in ways that can create ergonomic difficulties, he said, offering the example of work stations that are laid out in straight lines, forcing seated researchers to increase their reach distance.

He said that when employees start bringing devices such as pillows from home to provide arm support, it is apparent that there is an ergonomics problem that needs addressing.

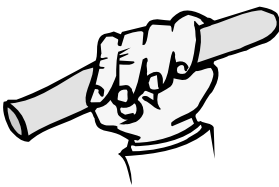
He discussed the value of ergonomic evaluations and stressed that one should worry less about the strict adherence to the rules of ergonomics and instead should think more about the function being performed.

"Textbooks always say push, don't pull, but you wouldn't want to apply that in every context," he said, illustrating the point with an example of trying to remove a container of hazardous material from a room. "Obviously, it is important to open the door first; that can be done more efficiently and safely with the material behind you, rather than in front of you."

Good ergonomics, he said, is really a matter of being aware of what you are doing and how you are doing it. He stressed all employees should pay close attention to the tools they use, how they use them, and any physical effects from their repeated use.

During his visit, Janowitz also spoke about construction and crafts work and material handling. He said more companies — and manufacturers — are paying attention to ergonomics.

He pointed to a recent issue of *Modern Materials Handling*, which featured several advertisements for fork trucks. "In recent years, several fork truck compa-



nies have improved the location of controls, so that people can sit up or stand properly when they are using the truck," he said.

"In that issue of *Modern Materials Handling*, there were three or four fork truck ads where the manufacturer's

main selling point was that they have improved the ergonomics. I didn't think I would ever live long enough to see fork truck manufacturers trying to pitch their products on the basis of good ergonomics, but we are starting to see it."

But he cautioned his listeners to carefully weigh the ergonomic claims of products in the marketplace. "When we choose tools, we should do so in a scientific way, not just because someone claims it is ergonomically better."

Janowitz has been involved in occupational health and safety programs since 1977. As a certified professional ergonomist, he specializes in the prevention and treatment of neck, back and upper extremity problems.

He is a member of the Human Factors and Ergonomics Society, the Bay Area Ergonomics Roundtable, the American Back Society, and the Orthopedic Section and Occupational Health Special Interest Group of the American Physical Therapy Association.

Janowitz has a bachelor's degree in industrial engineering, with a specialty in human factors, and advanced degrees in health systems administration and physical therapy.

The UC Ergonomics Program, for which Janowitz consults, conducts research to measure risk factors for chronic musculoskeletal disorders of the upper extremities and to evaluate hand tools and other engineering solutions designed to prevent these disorders

Call your ES&H team for a copy of the video.

TB
Continued from page 1

actually die of complications resulting from TB infections. One of the most insidious effects of tuberculosis is its persistence in a dormant state, from which it emerges in affected individuals when their immune system is weakened. In the Third World, nearly one third of the population is infected with TB, and up to 10 percent of them develop the full and often deadly disease.

The new consortium's goal is to determine the molecular structures of key proteins in *Mycobacterium tuberculosis*, the microbial pathogen causing TB.

The role of the LLNL Macromolecular Crystallography team, led by Bernhard Rupp, will be to provide crystals of more than 400 proteins of the tuberculosis bacterium. Specific proteins are the mol-

ecular cause for invasion and virulence of the bacterium, and thus represent prime targets for drug interaction. In order to design effective and specific drugs, the molecular structure of the target proteins must be known in great detail. For example, harmful interactions of the infectious bacterium disabling the patient's immune defenses can be understood in molecular detail and then consequently targeted with specific drugs.

"Therapeutic drugs as well as vaccines can be developed based on our structural work," said Rupp.

LLNL's Macromolecular Crystallography group will design computer-controlled, robotic devices to advance automated high-throughput crystallization of protein crystals. Tiny crystals of proteins are exposed to focused X-ray radiation, and from the diffraction pattern the three-dimensional, molecular structure of the protein can be reconstructed in great detail using modern crystallographic computing.

"Obtaining crystals of proteins is a key challenge in determining the molecular structure", said Rupp. "Without crystals there is no crystallography. Proteins are complex biological material, and protein crystals thus are very fragile and difficult to grow. We have had great success in crystallizing a variety of bacterial pathogens and determining the structures of tetanus and botulinum toxins.

"We are very excited about the possibilities to make significant contributions to the understanding and the final defeat of TB. Drug design is at the forefront of biomedical research and a great challenge for the whole TB structural genomics team," Rupp said.

Consortium members Lawrence Livermore National Laboratory; University of California, Los Angeles; University of California, Berkeley; Texas A&M University; and the Albert Einstein School of Medicine will receive funding from Los Alamos.

NIF
Continued from page 1

Director Bruce Tarter.

"This action validates the extensive peer reviews of NIF that the Department of Energy has spearheaded over this past year — all of which have been quite positive. Our employees have done a spectacular job to get NIF back on track and I am very appreciative of their efforts and the efforts of others who have helped with the project this year," Tarter added.

"We look forward to working with the Department of Energy/NNSA to ensure that the congressional recommendations are integrated into an effective pathforward for NIF."

"I am very pleased that the conference committee has agreed to fund NIF at \$199 million," added Rep. Ellen Tauscher, whose 10th congressional district includes the Lab. Calling the laser project "essential" to stockpile stewardship, Tauscher added "this agreement to provide the necessary funding confirms that the science behind NIF is sound and that the project can be completed with a minimum of delay."

Congressman Duncan Hunter, chairman of the

House Armed Services Subcommittee on Military Procurement, said he was "pleased that Chairman Ron Packard (of the Energy and Water Appropriations Subcommittee) provided this much-needed construction funding for NIF. This is a project that is very important to America's national security and this new funding will allow this critical program to continue."

"The bill shows a strong congressional commitment to the health of the Stockpile Stewardship Program, and provides needed additional support for both weapons science and production readiness throughout the complex," said Michael Anastasio, associate director for Defense & Nuclear Technologies. "The action to keep NIF on track is crucial to our future ability to evaluate stockpile issues and certify weapon performance."

Regarding other funding issues, the LDRD program, which permits utilizing a percentage of funding from each laboratory's budget to fund research selected by the lab, was increased from 4 to 6 percent. The final bill also includes language exempting scientific travel funded in LDRD accounts from the restrictions placed by Congress on other DOE travel. Additionally, the overall travel budget in the bill is increased to \$175 million up from \$150 million in the current year.

Sen. Pete Domenici, chairman of the Senate Energy and Water Development Appropriations Subcommittee, stated in his press release on the bill, "These provisions should help boost morale among lab workers by sending them a signal that we still value and appreciate their work." He referenced the Baker-Hamilton report issued this week, which concludes that demoralized personnel may threaten the necessary national security work at our labs.

For nonproliferation, the appropriations bill provides \$236 million; \$27.5 million total for the Nuclear Cities Initiative (\$10 million increase); \$24.5 million for Initiatives for Proliferation Prevention (\$2 million increase); and \$15 million added to International Materials Protection Control and Accounting. Furthermore, the bill contains \$2 million to start work on LLNL's new Sensitive Compartmented Information Facility.

Also, under the bill, DOE Small Business and Industrial Partnerships would get \$3 million to split evenly between Sandia, Los Alamos and Lawrence Livermore laboratories, for an initiative to create technology clusters of small businesses surrounding the labs. In addition, industrial partnerships are directed to more than double next year, from \$14 million in FY2000 to \$30 million in FY2001.



Check out the Employee Ads Web Services site at:
<https://www-ais.llnl.gov/newsline/ads/>

AUTOMOBILES

1993 - Mercury Capri, white/black top, auto, cruise, air, stereo, 94k miles, extra clean in/out. recent complete tune-up, runs great. 3995.00 925-443-2856

1995 - S10 Blazer Lt 4wd fully loaded, CD, Leather high output engine, towing, new tires excelent shape 59k mi \$17,000 BO 209-521-0509

1998 - Toyota Avalon Xls,Silver Color,Less Than 46k,Leather Seat, Auto A/C, Cd Player, Warranty,\$20k Or Best Offer. 925-426-0648

1987 - Honda Accord LXi, AC, AT, loaded, safe reliable car for young person, runs great and looks great, many upgrades, competition sound system, \$6K OBO 925-449-1409

1991 - Acura Integra GS, 128 kmiles, 2-dr, 5-spd, ABS, A/C, AM/FM, Moonroof, Alloy Wheels, Excellent Condition, \$5,995. 925-447-5329

1988 - Honda Accord dx, 162k miles. Great commuter car w/ac,am/fm cass,ps, 5-speed. Excel condition with no accidents. \$3700. 209-839-9757

1995 - NISSAN XE KING CAB LONGBED P/U. 96K, CD, 2 tone paint, bedliner, 5spd. \$7800/OBO. 925-516-9510

1989 - Toyota Camry 4dr, AT, AC, AM/FM/Cass,Pwr windows,moon roof,76K miles,\$5500/OB 925-443-2866

1992 - Plymouth Voyager 7-pass van - A/C, AM/FM cassette, Factory-tinted windows, Roof-Rack, Teal, 120K mls \$4200 OBO email 925-447-1428

Four BF Goodrich Radial TAs with chrome rims. 2 each P275-60R15 and 2 each P245-60R15. Asking \$150.00 209-823-2955

2000 - Honda Civic EX (2 dr), auto-matic-loaded. Excellent condition, still smells new. Must sell ASAP! \$16,000/obo. 925-455-6164

1996 - 1996 toyota corolla,4 dr,at,ac,ps,pw,pl-am/fm radio,low mileage,exc cond!-reg due 08/01-\$7500 after 5pm 209-339-1795

1930 - Ford chassis (30/31). Complete. Rolling, clean, gloss black, ready for body. Make offer 925-449-5089

AUTOMOBILE ACCESSORIES

Yakima SpaceCadet Rocketbox w. locks. Used only 7 weeks. 57 long, 37 wide, 14 high. Bought for \$250. Perfect condition. \$150.00 925-443-1673

1998 - 14 inch TIRES: 205/75/R14 good used TIRES fit many cars/pickups 2 for \$20, all 4 for \$30 (925)447-7070 925-447-7070

BICYCLES

12 speed street bike, \$50 obo 925-443-7841

Winchester bike trailer, for towing 2 kids up to 100lbs. Excellent condition. Safety features. Folds away for easy storage. \$250 OBO. 209-832-0913

BMX Specialized FatBoy,Chrome Finish,Mint Cond. \$250/offr. Girls 24in.wheel 21sp.Specialized MTN Bike. \$100/offr. 925-837-8780

BOATS

Hartley TS16, Sail Boat, trailer, motor, and all the gear. \$1250.00 925-462-6246

1994 BassTracker Tournament

TX17; 25/hrs on boat/motor, Mercury 40hp, Motorguide EF54 trol/motor, Humminbird wide-eye, much more \$5,500 447-0555 x261 925-443-2114

CAMERAS

MAMIYA C330 with three lens, and more \$650. firm. Some darkroom equipment, timer, sink and more. Call after 5:00 p.m. 209-892-6186

Twin lenas camera 3 lens/offer/ Misc. photo equip./albums/retail carry bags 925-735-6002

ELECTRONIC EQUIPMENT

Macintosh Power Performa P.C.6116CD,Excellent condition,Manuals and soft-ware,275.00 or B/O Personel laser printer,25.00. 925-371-5371

Supra Express 56K Modem for Macintosh. New in box. \$80/BO. Mac 3 port data switch (printer/modem). \$20. Jason. 925-443-2334

Computer Desk by OSullivan. Ash color. Like new, includes CPU/Printer stand. Must see. \$75.00 925-447-3780

Marantz AV surround sound reciever. Model SR-73 with AM FM. Dolby surround Pro Logic. Turn your TV into a home theater \$200. 925-600-0604

Texas Instruments TI-80 graphing calculator. New in box, never been used. Make offer. 925-846-3653

Blaupunkt 60 watt amplifer with 5-band equalizer. \$30.00 925-447-9273

GIVEAWAY

FREE Padded multihull diaper-type hiking out gear, miscellaneous cables. 925-449-6911

Quality twin mattrss, box spring & frame. Complete bed in great condition. I can bring it to the lab or you can drive to south SJ and pick it up. 480-281-2680

25 in. freestanding TV dark brown cabinet works well. You pick up. 925-846-7573

HOUSEHOLD

Grandfather Clock - fairly new \$1000 Hutch - glass door, lights and dining table w/ six chairs. Expand to sit 12 people \$1700 925-443-7068

Dryer, Whirlpool electric, Almond color, Newer model, good working condition - \$95 925-443-5565

Refrigerator. Good condition, works great. Approx 17 cuft. Off-white color. \$50.00 OBO 925-961-0381

Suitcases: set of 5 nested suitcases with locks \$25. Vacuum cleaner \$15. 925-443-5663

Large TV stand with smoked glass doors \$45; Two end tables with beveled glass tops \$50. 209-836-9082

8ft SOFA very good condition light creme with neutral print must sell \$75.00 obo after 5:00pm 925-828-0519

Contemporary style, loose pillow-back sofa & loveseat in beige, linen-like fabric, from Macys. Like new condition. \$550 or BO. 925-462-1463

Girl's desk and chair (pink and white) \$150. Girl's pink day bed w/ trundle (1 mattress) \$300. Secretary desk and chair \$50 925-606-8010

Desk, computer style, and printer stand. Very nice. \$75.00. 925-447-

3780

DESKS FOR SALE: Corner computer table, grey, \$30. Black and white w/light, \$10. 925-456-7972

HIDE-A-BED (couch makes into a double bed), floral upholstery, good condition. \$70/B.O. 925-447-2905

Queen Size Sealy Box Spring and Mattress,\$45. TV/Stereo stand, black,glass door, CD/video storage,\$35. Printer stand,\$15. 209-825-5489

GARAGE SALE Saturday September 30 1155 Xavier Way (off East Avenue) Livermore furniture, patio/garden and household 8:00 a.m. - 1:00 p.m. 925-447-8613

Piano-Upright, older with good sound board. \$100 925-443-4629

Amana 18 cu ft refrigerator, exc. condition, \$100. Kenmore heavy duty washer/dryer, electric, prof. rebuilt, \$80 for both. 925-373-0670

Oak dining set: nice quality, med. golden oak color, round pedestal table w/4 windsor chairs \$400, Oak hutch w/beveled glass doors \$250. 925-373-6870

Full size Futon \$50 925-456-0507

Oak computer desk with shelf above and below for software and other miscellaneous. \$45.00 925-454-1881

Sewing machine: 1905 Singer treadle in cabinet. Have reprint of manual and source for parts. 925-455-9409

GE Microhood, above range microwave, 2.5 years old, excellent condition, black exterior, \$225 OBO. 209-832-0913

Washer/Dryer, Whirlpool HeavyDuty, Like new (1.5 yrs old), Paid \$760, Asking \$400. 925-924-0286

Queen size four-poster bed, dresser and night-stand for sale. Mahogany wood, beautiful condition. 2 years new. Must sell ASAP! \$1000/obo. 925-455-6164

4 pc Bedroom set,2 nightstands, 4-drawer high dresser and a 9-drawer long dresser. \$175.00 510-793-6215

LOST & FOUND

Lost buck knife in lawn area next to the pool on 9/20. Please call 3-9079 or 925-634-5703

Point of Light pin lost 9/14 around the blds of 381,482,551,or 439. Very Sentimental. Pls call if found 925-449-6113

MISCELLANEOUS

FOLDING BABY CARRIAGE- with Canopy, Blue, sturdy, goes in a trunk, only \$18. And Umbrella Stroller \$6 925-447-7070

BOXES, CARDBOARD, STURDY moving/storage: Big and Bigger: 40 for \$50, Huge: \$2, Wardrobes: \$6 925-447-7070

Xerox Copier, Model 5310, Serial Number 0011221. Needs toner. Best Offer. 925-443-1673

Childrens desk with chair \$15. Childs potty seat and step stool - never used \$5. 925-443-5663

White Shell for 8 foot bed truck in great shape.\$ 200 Will throw in a bed liner with shell. 925-373-8360

Fireplace Insert, Glass doors, Blower \$495 925-606-0235

FasTrack Exercise Machine, \$35. EZ Abs rocker,\$15. MiniMax workout bench, \$25. 209-825-5489

S.F. OPERA TICKETS, two, Donizettis L Elisir d Amore, excellent seats, dress circle, first row center, Sun Nov 05, 2000, 2 pm.

\$100 each. 925-447-9065

GARAGE SALE Saturday September 30 at 1155 Xavier Way (off East Avenue) Livermore furniture, patio/garden and household 8:00 a.m. - 1:00 p.m. 925-447-8613

Brass piano lamp; tensor lamp that attaches to bed headboard. Make offer for either or both. 925-846-3653

Join us for a Traditional Native American Sweat Lodge. All are welcome. Saturday Oct 7th at 5 pm here in Livermore. 925-294-6407

Garage Sale-Saturday 9-30, 8:00-4:00 3 Families, Furniture, Baby Items,Crib,486 Computer, Printer, Clothes from 6mos to Adult-Lots of Misc 925-449-8959

Victrola, early 1900s, console model in good working condition. Includes over 40, 78 rpm records. \$650.00. Call after 6 PM. 209-836-0116

4 pc bedroom set, 5 months old,exc cond, dresser,2 in-tables, queen size bed, only \$300!! will deliver, home phone 209-955-6974

MOTORCYCLES

1976 - Honda Goldwing 1000, New Tires & Windshield. Runs Great! Garaged, In Excellent Condition! 39K \$2200.00 Call after 6pm 209-293-4503

1981 - GL1100, well maintained, good machine, new tires and brakes 2.5k or make an offer 707-580-2074

1995 - Hein Gerkie leather jacket, XXL, liner, elbow pads, \$450 new, real nice, hardly worn, \$200obo. AVG Quasar helmet, LG, black, like new, \$150obo. 408-280-2680

MUSIC INSTRUMENTS

12 string acoustic/electric guitar \$130. Digitech DSP guitar processor: delay, reverb, flange, etc \$100. Simons wireless transmitter/reciever \$50. 209-836-9082

Electronic guitar tuner; folding chrome music stand; condensor mike plus heavy duty stand w/boom; misc. guitar stuff. Make offer. 925-846-3653

Wah-wah pedal. Bruno Fuzz-Wah with two-levels of distortion boost. \$45.00 925-447-9273

Yamaha Electric Piano Model PSR-270. Box opened, but never used. For sale \$99.00 650-348-8872

I have a Peavey B90 bass guitar, excellent condition, PJ pickups, active electronics. Want to trade it for a comparable quality electric 6 string. 925-447-8845

PETS & SUPPLIES

Suffolk Ewes, born 2/00. An asset to any breeding program. 4H/FFA student w/10 yrs. experience went to college, needs money. 925-449-0865

6 x 6 ft chain link fence sections for a 6 x 12 ft dog kennel w/ a 6 x 6 ft chain link door panel, exc cond, \$200 925-606-0755

55 gal. Tru-View with all equipment and very nice stand.All in very good codition. \$75.00 Call Evenings or weekends. 925-447-3780

7- 6f sq. cyclone fence panels plus 1 - gate panel. great for dog run. was \$350.00 new - make offer. 925-600-7953

Pet bird Manzanita tree, floor standing, casters, 2x3 ft base tray, 4 ft tall, food cups, hooks for toys, all manzanita, unused, \$160 value, ONLY \$70 925-447-5434

Zebra finches born early this sum-

mer, free to a good home. 925-829-2608

RECREATION EQUIPMENT

Men/Boys Hockey equipment. Med & Lge, Koho Gloves and Pants, CCM Chest Pads, Knee Pads Elbow Pads, Bag Included \$100.00 for each set 1-Helmet 925-373-4713

Above ground pool.15ft round 4ft deep,cartridge filter, solar cover, ladder,accessories. \$500.00, u haul. Eves. 925-447-3178

RC Airplane, Tiger Trainer 60ARF, never flown, wing span 73inch, length 58inch, weight 6-7 lbs, eng.60, radio 4 channel, pd \$495, sell \$395 or BO. 925-443-8950

RIDESHARING

Express your commute, call 2-RIDE for more information or visit the web site at <http://www-r.llnl.gov/tsmp/> for more information

MODESTO - Carpool needs one driver/rider. Each person drives one week per month. Meet Mall area. Wk hours 7:30-4. Flex. 209-557-0456, ext. 2-8828

Danville - Vanpool has opening for upto two riders. Normal 8am-4:45pm shift. \$50/mo. Tax credit can lower this cost. 925-837-4097, ext. 2-6234

Fremont - Commuter blues? Join van and save pretax dollars too. Work schedule 8am-445pm. 510-792-7848, ext. 4-3791

Richmond - Van operating from Richmond through El Cerrito, Albany, Berkeley and Oakland with stops on Hwy 13; 7:45-4:30 510-223-4244, ext. 2-3193

East Contra Costa - Deluxe commuter buses from Antioch, Oakley, Brentwood & Byron provide service to the 7:00 a.m. and 8:00 a.m. shifts. 925-754-6622, ext. 2-7433

Ceres/Modesto - 14 psgr Enterprise luxury vanpool, 7:00-3:30 209-537-0229, ext. 3-6631

SERVICES

AFFECTIONATE PET CARE SERVICES Personalized in-home services for your pet. Daily Walks, feedings, water plants, pick up mail etc. 925-208-1142

Hauling Service. Estate cleanouts, Attics, Garage, Shed & Barns. Misc....PU & Del. avail. 925-373-9540

Roofing, 28 yrs experience, fully insured 925-454-9200

SHARED HOUSING

Livermore - 2 rooms avail. Full priv. Wired for phone, cable, & computer network. Easy access to 580 and Lab. No pets. \$475 + utilities (each room) 925-786-6288

TO TRADE

have a Peavey B90 bass guitar, excellent condition, PJ pickups, active electronics. Want to trade it for a comparable quality electric 6 string. 925-447-8845

TRUCKS & TRAILERS

1984 - Chevy K5 Blazer, runs good, okay tires, brush guard, body straight, removeable top, needs TLC. \$2,500 OBO 925-449-0865

1995 - Blazer S10 Lt 4wd CD leather, high output engine, towing new tires, excellennt shape 59k mi, fully loaded, \$17,000 BO 209-521-0509

DIRECTOR’S OFFICE

Continued from page 1

of approximately seven inches. Dry conditions within welded tuff will minimize the prospects for water to contact the waste canisters, the principal mechanism by which radionuclides might dissolve and be transported to the accessible environment.

The site is 100 miles northwest of Las Vegas, on federal lands, adjacent to the Nevada Test Site. Groundwater, about 1,000 feet below the repository, is isolated in a closed geologic basin.

These three site characteristics — remote location, deep water table and arid conditions — form natural barrier systems. Double-walled canisters, with an outer wall of highly corrosion-resistant alloy C-22 and an inner-wall of high-strength, nuclear-grade stainless steel, together with a drip shield of titanium, form the engineered barrier system. Together, these systems provide redundant safety systems, or “defense in depth.”

The Nuclear Regulatory Commission’s draft regulation requires evaluation of a 10,000-year period. This regulatory time period for the repository requires extrapolation data developed over

several years. Lab researchers are accomplishing the challenging task of building reliable models verified through both laboratory and field testing, to simulate how the repository will perform over thousands of years.

Lab researchers also continue to conduct extensive investigations on preferred canister materials. The Lab has a long-term corrosion test facility where more than 18,000 alloy samples, called coupons, are submerged in tanks filled with a variety of simulated groundwater compositions characteristic of the Yucca Mountain site. Corrosion activity is evaluated after six months to as much as 10 years by weighing the coupons and by using advanced measurements such as the atomic force microscope. The microscope measures atomic-scale changes in the sample surface. In additional experiments, the effects of temperature, relative humidity, tensile stresses and strains in the welds of the canisters, and microbial activities are being monitored. This work will be the basis for canister material selection and double-wall configuration.

A multi-scale thermohydrological model evaluates the heat effects on the mountain based on various canister placement plans and climate scenarios. This complex model can be used to evaluate candidate engineering designs. More

importantly, it can contribute to the overall demonstration that the proposed repository’s safety case will meet all regulatory requirements.

While the Lab addresses the scientific and technical issues, other challenges and reviews are still to come. The draft site recommendation is scheduled for a December release. Public hearings will be held. The Nuclear Regulatory Commission (NRC), which will ultimately consider a license application for the site should it be chosen suitable, will issue comments in May 2001.

If all goes as planned, the energy secretary will decide whether to recommend the site to the president in 2001. If the president considers the site qualified, he will recommend the site to Congress. The governor of Nevada may then issue a notice of disapproval, which can be overruled by a vote of both houses of Congress. A license application would then be submitted with an environmental impact statement to the NRC in 2003. Once the site is approved, construction would begin in 2005, with the repository ready for operation in 2010.

During this time, the Lab will continue to play a key role in the myriad of challenges ahead, and will continue through operational performance confirmation.

CLASSIFIED ADS

1992 - CHEVY 1500 Extended Cab. Custom by Bell. Excellent running condition. Black exterior w/gray fabric interior. \$7,000.00 O.B.O 925-443-1571

1979 - Chevy 1/2 Ton PU Long-bed \$2000.00 925-447-0558

1987 - Ford XLT Lariate, 4WD, Auto. Trans., new paint, new interior, new 16 in. tires & rims, PS,PB,PW, loaded, 134K miles. \$6000 Firm. 925-443-0642

1995 - Mazda B3000 Extended cab, w/ shell, 5 speed, A/C, \$9000 209-833-1219

1987 - Prowler 24ft travel trailer. Front door, rear twin bunks.Sleeps 6. Good condition. \$4000/offer. 209-368-4286

1984 - Trailer, Road Ranger,Refrigerator, Heater, Air Conditioner, Spare Tire, sleeps four, etc., \$4,495 925-447-6819

1988 - Ford F250 Heavy Duty XL 4WD extended cab 5.8L auto, \$8900. 925-455-8609

1983 - Chevy one ton, Silverado, 4-WD, 4-door dually, lg bed w/liner, PS, PB, AC, alloy wheels, cruise, tilt, sliding rear window, 42K miles. \$7,500 OBO. 925-462-4328

1979 - GMC Heavy 3/4T PU. 350-4 sp tow package. Needswork, Burnt exh valve \$700 Call Joe 209-869-2792

1996 - 29 foot Sea Breeze motorhome for sale. Has TV, roof air, AC generator, awning, HWM levelers. Well maintained, clean unit. Price \$37,000. 925-447-5016

1982 - 4x6 Utility trailer, \$125 925-443-4413

1988 - Chevy 1 ton, Silverado, 4-dr. dually. Pwr win, door locks, cruise, tilt, 52K miles, new A/C. Excellent cond. \$11,500.00/OBO. 925-456-3010

1995 - Motorhome Thor Residency 36 feet, 230 Diesel cummins, 12K miles, NADA appraisal with options \$86,745. Tow package. \$77,700. 925-449-0430

1973 - Older 9 foot Wilderness cab-over camper. Needs some work or use for parts.\$250 209-239-2737

1993 - Jeep Wrangler, Black brand new tires, new clutch. \$7,000. Never off road. 925-833-2527

1958 - Dodge D100 V-8 1/2T PU 33K original miles VERY CLEAN no dents and runs great. \$3,000 OBO. Must Sell. 925-648-1930

1994 - Isuzu Rodeo LS, 4-Door SUV, 2WD, AT, AC, AM/FM Cassette, Power Windows/door locks, Moon Roof. Approx. 86K miles. Excellent Condition. \$9500.00 925-778-5231

12 ft Cab over Camper. Side access-self contained \$575.00 OBO Call after 6pm 209-293-4503

1990 - FWD Ranger New Tires, New V6, New Lumber rack, cd player-\$5500 707-580-2074

1998 - 1998 Chev-Blazer 2DR ZR2-Susp. 4X4, 4.3 V6, 5spd Auto Red ext. Gray int. Sun Roof, Rf Rack, CD&tape, Alloy Wheels. Like new 22,500 mi. \$21,500 925-734-8821

1998 - Chevy Silverado Ext. Cab w/3rd door, one of the last 350 V8s, fully loaded, Tow pkg. excl cond. Too many extras to list. 48K Hwy mileage. \$22,000 OBO 209-571-3432

1990 - GMC Sierra 1500, 4-6drop,budnik wheels,phantom grille,rollpan,smooth tailgate,flow-master,new tokico shocks,air bags,alarm,very clean,\$11,000. 209-823-8237

1994 - GMC SLe 2WD w/70,000 mi. AC, PS, PB, CD and many other custom items. Fire-engine Red. Very clean. \$13,000 obo. 209-586-9261

1997 - Ford F150, 3 door, super cab, long bed with liner, AT, V8, AC, PW, PS, \$16,000/obo. 925-455-1250

1994 - Mazda B3000 SE Cab Plus. Automatic Trans, CD Player, Power Steering, 70K miles, Ex Cond \$8500 or B/O 209-836-3969

1998 - Chevy 3500 Crew Cab. 7 1/2 inch suspension lift, 3 inch body lift, 38 inch tires will also give 35 inch tires. All the extras - must see. \$27,000 925-513-0412

VACATION RENTALS

Maui, HI - Condo, RCI Gold Crown, Lg 1 bd, 2 ba, slps 4. big discount. 1 or 2 wks avail. 925-447-0856

Maui, HI - Kahana Reef ocean-front 1BR/1BA condominium. Beautiful two-island view, ocean-side pool, and BBQs. Low LLNL

rates for year-round reservations. 925-449-0761

MAUI-Kihei- 1,2 & 3 bedroom condos. Oceanfront, big pool, large lawn area, BBQ pits, tennis courts, washer/dryer in units. 925-846-8405

LOS CABOS, MEXICO TimeShare for rent Week of Dec.23-Dec.30 Right on the ocean....Call for details....Full kitchen sleeps 4-6... 7 mi from airport. 209-825-5687

SOUTH LAKE TAHOE - 3 Bedroom 2 Bath Chalet, nicely furnished,quiet area , all amenities,close to all ski areas,Reserve Now! 209-599-4644

Palm Springs - --luxury hotel resort, furnished 2-bed apartment with full kitchen. 7 nights for Thanksgiving week (11/19/00 to 11/25/00). \$128/night. 2-5630, 925-606-5660

Eagle Lake Vacation Rentals-Close to water, boat launch, airstrip, stores, lodge. Great trout fishing & family fun. 530-825-2131 or 209-543-1845

Pinecrest - (Off Sonora Pass Road), 3 bdrm/2 bath, frplc w/wood, microwave, barbecue, pool table, large deck and view up No. Fork of Tuolumne, \$175/wknd. 925-449-5513

WANTED

Gas Dryer, Kenmore or Whirlpool, White or Almond 925-443-5565

Wanted: Small home/duplex rental general Lab vicinity for woman and son. Quiet renters 251-3813 or 449-1644

camper shell for chevy full size long bed truck, preferably white. 209-832-5506

Looking for GUITARIST to jam with at lunchtime. Call for more info. 925-634-3638

Need Sega Genesis System and Games. 209-531-1527

Used alto saxophone in excellent condition for student musician. Willing to pay going rate. 925-516-1501

Finish carpenter to build (built-in) entertainment center. Across from lab. 925-455-5066

Baby jogger in good/excellent condition for reasonable price. For either one or two children. 925-454-1881

Need rental of quiet 2 bed+ house, duplex, cottege or double wide mobile, in Livermore valley area for one. 925-447-9457

Looking for a 1968-71 muscle-car,gm, ford or chrysler- not particular. 209-368-4286

Large back yard climbing structure in very good condition. Want tall fort, slide, climber, swing combination. 925-426-6872

Wanted some one to farm oat hay on my 40 acres in Livermore 925-371-1465

Do you have chronic muscle pain? I need bodies to practice on. Professional Massage Therapist in Training. Tri-Valley area. 510-791-8623

Wanted: Someone to haul away broken concrete and yard debris. Will pay reasonable rate. 925-513-1411

Finish Carpenter to install ceiling staircase, wood trim on windows, etc. Will pay reasonable fee. Livermore location. 510-713-9873

WANTED: old bikes and riding toys. 1970s or older 925-449-0388

File cabinets, 4 or 5 drawer standard width, prefer rugged old ones in good condition. No repositories need apply! 510-728-4336

Jack Rusell Terriers looking for new home, stay together if possible, 1 male, 4 yrs. 1 Female, 3 yrs. Call for details. 925-833-2527

Wanted child sitter for twin 13 year old boys when I am on business travel, or working the evening shift. Needed occasion-ally. 925-455-5624

Wanted: Family of 4 looking for long-term rental housing in Livermore. Desire 3/4 bdr., 2 bath, reasonable rent. 925-443-5917

16 foot canoe wanted. Good stable canoe for general family use. Will pay reasonable price. 209-835-3782

Small refrigerator and/or freezer for evening project at LLNL. 462-6237

Books, CDs and videos for book-sale to raise money for Xmas gifts for needy kids. Next sale at the Lab starting 10/9/00. 925-456-6725

Need a Tutor to help with Pre-Algebra. I am willing to meet 1 or 2 time per week during lunch or after work or weekends. 209-832-2060

Part-time Nanny needed 2-3 days a week for two boys ages 7 months & 2 years. Non-smoker. Fax resume with references 925-373-7878

Guidelines

Newsline is not responsible for any errors contained in the classified ads. It is up to the employee to proofread his or her ad to make sure it contains the correct data, including the phone number.

Employees are reminded that only car- and vanpool ads may contain Lab extensions. E-mail addresses are not allowed.

Due to space limitations, Newsline cannot run ads that are submitted in all capital letters. “Personals” ads are not permitted either.

Employees may submit one ad per category, but may not include the same ad in more than one category.

Ads may only be submitted through the Employee Ads Web Services site https://www-ais.llnl.gov/newsline/ads/



THE BACK PAGE

SCIENTISTS

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‘Mr. Science’ from a historical perspective, and Dr. Steven Chu, who is the model of an excellent communicator.”

The symposium was co-sponsored by the Lab’s Science & Technology Education Program (STEP), UC Davis’ Department of Applied Science and Sigma Xi. A team of five local high school science teachers, including Hitomi, worked closely with Lab scientists for several months to develop the material for the two-day event.

“The scientists brought in the content and cutting-edge technology and the teachers helped integrate that into lesson plans that participants could use in their classrooms,” Hitomi said.

There were many Lab scientists who played a key role in developing the materials and teaching the workshops. The group leaders were Andrea Cook of Earth & Environmental Science, Chris Ebbers of Physics, Allen Grayson of Chemistry & Materials Science and Joanna Albala of the Biology & Biotechnology Research Program. In addition, at least 20 scientists and technicians worked during the two-day event leading tours and workshops, said Dick Farnsworth, head of STEP’s outreach program.

Earlier this year, Farnsworth met with the five teachers and asked what the Lab could do that would be meaningful for science educators.

“The answer was that textbooks are eight-10 years out of date. Teachers want to know what is going on now that they can take back to their classrooms,” said Farnsworth. “We wanted to show them what real labs

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With this symposium, we’re tying activities to state standards, and helping teachers in their careers.

— Don Correll, STEP director

”

look like, real tools and real science, and then give them materials that they could take back to the classroom.”

Each of the teams of scientists was paired with a teacher to develop the coursework for the symposium. Invitations were mailed to school districts throughout the state and the 125 openings filled quickly.

Once they arrived at the Lab, the symposium participants were divided into four groups by discipline: biology, environmental science, physics and chemistry. They toured laboratories in those areas, and participated in content-oriented discussions with Lab scientists and hands-on activities based on real research.

“I gave a Science on Saturday-like lecture on radiocarbon dating, then we did two hands-on activities using radiocarbon data for predicting volcanic eruptions and finding fossil earthquakes,” Cook said. “It was all based on real research. The teachers responded really well.”

In addition to the hands-on experience they

gained, the teachers also took home a notebook of lesson plans and hands-on activities that were based on actual laboratory research and directly related to the research workshops they attended.

“Many teachers commented that they were taking home lessons that they could use the very next day in their classes,” Hitomi said. “The lessons they will be using in their classrooms are based on the cutting-edge research being done in the laboratories. It was a really good opportunity for teachers to see collaborative work and see that it is possible.”

STEP director Don Correll noted that all of the lessons were directly tied to the new state standards for science, and the California Science Teachers Association endorsed the symposium.

“The new science standards are one thing that ties all schools together,” he said. “With this symposium, we’re tying activities to the state standards, but we’re also helping teachers in their professional careers. The symposium provided an opportunity for them to meet Lab scientists as well as to network with each other.”

Added Farnsworth, “Some of the teachers we work with on a regular basis told me they thought this was the best thing the Lab’s education program has ever done. I started receiving e-mails from the teachers on Monday about how much they enjoyed it.”

As Steven Murov, of the Science, Mathematics and Engineering Division at Modesto College, noted in his e-mail: “The workshops, presentations, tours and opportunities to discuss science education with other faculty was a fruitful and enjoyable experience, and I hope the first of many events...Research at LLNL will certainly provide a great opportunity for community college faculty to find out what is going on in the real world and perhaps contribute positively to research.”

TELLER

Continued from page 1

To be interested in science is more important, and to generate interest in what science is doing.”

He began his talk with a discussion of technological progress and the advent of nuclear weapons in the 20th century. “I’ve only participated in 93 years of it,” Teller quipped.

Millions of people died in the century’s two “terrible wars,” he said. “The number of people killed by conventional weapons was 100 times greater than those killed by nuclear weapons.”

Each war introduced new technologies, new weapons such as machine-guns, airplanes “and last and least, nuclear weapons,” Teller said. “All of that was new and all of that was unavoidable.”

In the 50 years since nuclear weapons were developed “we have talked about nonproliferation,” he said. “In those 50 years, nuclear weapons have proliferated and many countries know about them.

“Progress cannot be held up. All that we can do about this is use it constructively,” Teller observed. “I think it is wrong not to pursue progress.

“New knowledge, new instruments and new possibilities all can be used in a positive way,” he said. “We should not be afraid of what is new, we should be interested in it.”

The development of global telecommunications “has made the world much smaller,” Teller said. “The world has become a unit, that’s obvious. What’s not so obvious is how we can use this, not in conflict, but in cooperation to make the world a better place.”

He cited weather prediction as an example. At the dawn of the space age 50 years ago, weather could be predicted only two days in advance, Teller said, noting that computing power today allows five-day forecasts. “While this is relatively small progress, you must remember small effects have big consequences in weather prediction,” he said.

Teller proposed a relatively inexpensive way to extend forecasts to 15 days by floating billions of tiny hydrogen-filled spheres that would “escape the atmosphere” and satellites. Reflectors on the one-inch diameter spheres distributed around the globe would provide satellites with “very accurate” information on positions and velocities as well as temperature and humidity.

Investment in such a system would “pay off a hundred fold,” Teller said. “To find out when to plant and where to harvest around the world, that will pay off.”

Advance information on weather disasters would save lives and allow authorities time to prepare, he said. “It’s more than good business. It would show how every country in the world could profit. And it would help people appreciate each other.”

Teller pointed out that the beauty of the idea is that “it’s simple. It’s a very good example of what engineering can do.”

Turning to another of his favorite topics, Teller discussed the basic building blocks of life, DNA, and the nature of life in the universe wondering “when God created life, did he create it the same way throughout the universe?”

“There are zillions of planets that could support life,” he said. “Are the letters (of the genetic code) the same everywhere or are life forms on other planets as different as we are from fish?”

He recalled a lunch with physicist Enrico Fermi, a leader of the Manhattan Project when Fermi asked out of the blue “where are all the people?” This became known as Fermi’s paradox: if there’s such a variety of life on Earth, why wasn’t life evident in the rest of the universe.

Teller said he would like to organize an expedition to Mars to seek answers to some of these questions.

The phenomenal distances between stars and the million years required to travel to even the closest stars makes it difficult to answer these questions, he said, observing that “God has created the universe in such a way he could make mistakes independently, so people couldn’t get together and criticize him.”

Teller fielded questions from the educators, forewarning them that “you can ask me any question, but you don’t need to believe my answers, risking that I might be wrong.”

In his introduction, Rick Freeman, Edward Teller Professor and Chair of the Department of Applied Science (DAS), UC Davis, enumerated Teller’s many contributions to and staunch advocacy of science education.

Teller founded the DAS and encouraged interactions between universities and the Laboratory from its earliest days, Freeman said. “This Lab has been very fortunate since its creation to have UC right next door. That didn’t happen by accident. Teller created the DAS

in 1962.”

Freeman recalled that in his early writings, Teller emphasized that “you don’t do science in a vacuum and you don’t do it by pointing fingers...you run an open environment and you invite as many university people as you can.”

At the time of the Manhattan Project, security people went to President Harry Truman and recommended he close access to the Los Alamos Lab and remove foreign scientists, Freeman recounted. “Truman said ‘the solution is not yours. You’re never going to keep secrets. You have to work faster.’”

Freeman said he hopes the Teller model for doing science “isn’t broken” by security measures restricting interactions with university and foreign scientists.

If current security policies had been in place at the time Livermore Lab opened, “this man would never have been allowed inside these gates,” Freeman said, indicating Teller. “This country’s strength in technology comes from having an open environment and having people who aren’t citizens included.

“I have to educate my students and that is difficult when I have to answer ‘where do your students come from?’” he said. “This has got to stop.”



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